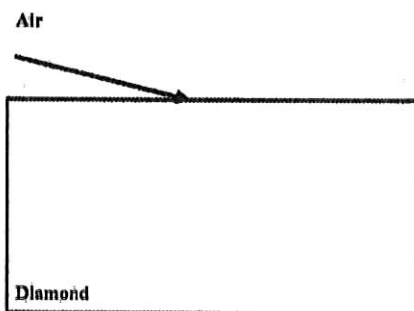


Name _____

Date _____

- ✓1. Light travels from crown glass into an unknown medium with an angle of incidence $\theta_i = 49.5^\circ$. What is the index of refraction of this medium if the angle of refraction was measured to be $\theta_r = 36.2^\circ$?
- ✓2. Light travels from ^{Ruby} ~~Plexiglass~~ into ^{ANTIFACE} ~~ruby~~. What is the angle of incidence if the angle of refraction is measured to be ~~18.8°~~ ^{45.0°}?
- ✓3. Light travels from water into diamond. What will be the angle of refraction in the diamond if the angle of incidence is 60.0° ?
- ✓4. A ray of light in air strikes diamond and another strikes a piece of fused quartz, in each case at an angle of incidence of 40.0° . What is the difference between the angles of refraction?
- ✓5. Light travels from zircon into fused quartz. What is the critical angle in the zircon?
- ✓6. In each of the following questions, the second medium is air. a) What is the critical angle if the index of refraction for a medium is 1.68? b) What is the index of refraction of a medium if the critical angle is 40.0° ?
- ✓7. What is the difference between the critical angle ^{for} light traveling from ruby-to-air and the critical angle for light traveling from water-to-air?
- ✓8. Light is traveling from water into crown glass. What is the largest possible angle of refraction? ^{whole}
- ✓9. What is the angle of refraction if light is traveling from diamond to water and the angle of incidence is 55.3° ?
10. What is the angle of incidence if light is traveling from water into zircon and the refracted angle is 62.5° ?
11. A cubic container contains air, water, glycerin, and diamond. There are no spaces between the boundaries of each and all boundaries are parallel. For light to travel through all of the substances, what is the maximum angle of incidence of the light ray in the diamond? (*Hint* draw a diagram to get started.)
- ✓12. In the image below, light is traveling from air into a rectangular piece of diamond. Draw the path that the light ray will take through the diamond, ~~and its path once it exits the diamond and determine the lateral displacement.~~ Label all angle measurements.



Trace the light rays through the substances

